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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|---|---|---|---|---|
| 10/672,045 | 09/26/2003 | Frederick David Gray | 1780-03601 | 7169 |

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| EXAMINER | |
|---|---|
| LE, TOAN M | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 2863 | |

DATE MAILED: 12/22/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 10/672,045 | GRAY ET AL. | |
| | Examiner | Art Unit | |
| | Toan M Le | 2863 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --*

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *26 September 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-19* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☒ Claim(s) *1-11* is/are allowed.

6)☒ Claim(s) *12,13 and 16-19* is/are rejected.

7)☒ Claim(s) *14 and 15* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *26 September 2003* is/are: a)☐ accepted or b)☒ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☒ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *6/14/04; 10/28/04*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 12-19 are rejected under 35 U.S.C. 102(b) as being anticipated by "Fractured Reservoir Characterization and performance Forecasting Using Geomechanics and Artificial Intelligence", Ouenes et al.).

Referring to claim 12, Ouenes et al. disclose a method incorporated into a system for reservoir fracture characterization, the system comprising: an information storage device having seismic traces; and a processor configured to retrieve and process the seismic traces to determine an array of reflection anisotropy values, wherein the processor is further configured to determine a relationship between reflection anisotropy and a measure of fracture intensity at one or more well positions (page 426, 2nd col., 3rd paragraph; page 427, 1st col., 2nd , 3rd , and 4th paragraphs).

As to claim 13, Ouenes et al. disclose a method incorporated into a system for reservoir fracture characterization, wherein the measure of fracture intensity relates to fluid production from wells at the one or more well positions (page 426, 2nd col., 3rd paragraph).

Referring to claim 16, Ouenes et al. disclose a method incorporated into a system for reservoir fracture characterization, wherein the processor is configured to determine the relationship by training one or more neural networks 9page 428, 2nd col., 2nd and 3rd paragraphs).

As t claim 17, Ouenes et al. disclose a method incorporated into a system for reservoir fracture characterization, further comprising: a graphical display coupled to the processor and configured to present a view of fracture intensity measurements as a function of position, wherein the processor is configured to generate the view by applying the relationship to an array of reflection anisotropy values (figures 3-6 and 9).

Referring to claims 18-19, Ouenes et al. disclose a method incorporated into a system for reservoir fracture characterization, wherein the display presents fracture intensity measurements as a function of two spatial dimensions (figures 3-4) and three spatial dimensions (figure 9).

Claims 14-15 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

***Allowable Subject Matter***

Claims 1-11 are allowed.

The primary reason for allowance of the claims is the inclusion of obtaining and combining seismic traces into gathers that reveal acoustic reflectivity as a function of offset, azimuth, and position (AVAZ), measuring reflection anisotropy as a function of position, determining a relationship between reflection anisotropy and fracture intensity measurements at specific positions and applying the relationship to reflection anisotropy measurements to create/map a set of fracture intensity measurements.

Ouenes et al. in 'Fractured Reservoir Characterization and Performance Forecasting Using Geomechanics and Artificial Intelligence' and Zellou et al. in 'Improved Fractured Reservoir Characterization Using Neural Networks, Geomechanics and 3-D Seismic' teach

obtaining 3-D seismic travel time and 3-D average amplitude instead of using AVAZ to determining a relationship between reflection anisotropy and fracture intensity measurements at specific positions and applying the relationship to reflection anisotropy measurements to create/map a set of fracture intensity measurements.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

***Conclusion***

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

"Fractured Reservoir Characterization Using P-Wave AVOA Analysis of 3D OBC Data", Hall et al., The Leading Edge, August 2002, pages 777-781

"Fractured Detection in Manderson Field: A 3-D AVAZ Case History", Gray et al., The Leading Edge, November 2000, pages 1214-1221

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Toan M Le whose telephone number is (571) 272-2276. The examiner can normally be reached on Monday through Friday from 9:00 A.M. to 5:30 P.M..

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, John Barlow can be reached on (571) 272-2269. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Toan Le

December 16, 2004

John Barlow
Supervisory Patent Examiner
Technology Center 2800